

10/581 913

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
16 June 2005 (16.06.2005)

PCT

(10) International Publication Number
WO 2005/053603 A3

(51) International Patent Classification:
C12Q 1/68 (2006.01) *A61K 51/00* (2006.01)

(21) International Application Number:
PCT/IL2004/000972

(22) International Filing Date: 25 October 2004 (25.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/527,273 8 December 2003 (08.12.2003) US

(71) Applicant (for all designated States except US): YEDA
RESEARCH AND DEVELOPMENT CO. LTD.
[IL/IL]; at the Weizmann Institute of Science, P.O. Box
95, 76 100 Rehovot (IL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): COHEN, Irun, R.
[IL/IL]; 11 Hankin Street, 76354 Rehovot (IL). DOUEK,
Daniel [GB/US]; 5331 McKinley Street, Bethesda, MD
20814 (US). MIMRAN, Avishai [IL/IL]; 51 Meginey Ha-
Galil Street, 76200 Rehovot (IL). CARMI, Pnina [IL/IL];
3 Marton Street, 76292 Rehovot (IL). QUINTANA, Fran-
cisco, Javier [AR/AR]; 1831 1H Teniente Benjamin Ma-
tlenzo, Capital Federal, 1426 (AR).

(74) Agent: G.E. EHRLICH (1995) LTD.; 11 Menachem Be-
gin Street, 52 521 Ramat Gan (IL).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,
SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
14 September 2006

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: ANTIGEN RECEPTOR VARIABLE REGION TYPING

(57) Abstract: A method of typing a variable region of a specific variant of an antigen receptor chain is disclosed. The method comprises: (a) exposing a probe set to a sense or antisense strand of a polynucleotide encoding at least a portion of the variable region of the specific variant of the antigen receptor chain, wherein the probe set includes a plurality of probe molecules, wherein each probe molecule of the plurality of probe molecules is substantially complementary to a sense or antisense strand of a nucleic acid sequence region of a specific polynucleotide encoding a variant of the antigen receptor chain, the nucleic acid sequence region encoding a specific combination of at least two variable region segments of the antigen receptor chain; and (b) measuring a hybridization of each probe molecule of the plurality of probe molecules with the sense or antisense strand of the nucleic acid sequence region of the polynucleotide encoding at least a portion of the variable region of the specific variant of the antigen receptor chain, thereby typing the variable region of the specific variant of the antigen receptor chain.



WO 2005/053603 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL04/000972

A. CLASSIFICATION OF SUBJECT MATTER

IPC: C12Q 1/68(2006.01)
A61K 51/00(2006.01)

USPC: 435/6

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 435/6

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
CAPLUS, MEDLINE, SCISEARCH, BIOSIS, US PATENTS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KLEIN, U. et al. Gene Expression Profiling of B Cell Chronic Lymphocytic Leukemia Reveals a Homogeneous Phenotype Related to Memory B Cells. J. Exp. Med. 03 December 2001, Vol. 194, No. 11, pages 1625-1638, see entire document.	1-11, 13, 14 and 16-18

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
06 March 2006 (06.03.2006)

Date of mailing of the international search report

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-3201

Authorized officer

Jeff Lundgren

Telephone No. 571-272-1600

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL04/000972

Box No. II Observations where certain claims were found unsearchable (Continuation of Item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-18

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL04/000972

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-18, are drawn to a method for typing a variable region of a specific variant of an antigen receptor chain, comprising exposing a probe set to a polynucleotide.

Group II, claims 19-31, are drawn to a probe array.

Group III, claims 32-42, are drawn to a set of probes.